720 Olive Way, Suite 1900
Seattle, Washington 98101
206.287.9130

ANCHOR QEA

Memorandum

August 23, 2017

To: Sean Sheldrake, U.S. Environmental Protection Agency, Region 10

From: Ryan Barth, Anchor QEA, LLC

cc: Bob Wyatt, NW Natural
Patty Dost, Pearl Legal Group
Dana Bayuk, Oregon Department of Environmental Quality
Myron Burr, Siltronic Corporation
Michael Murray, Maul Foster & Alongi
Carl Stivers, Ben Hung, and John Verduin, Anchor QEA, LLC

Re: Revised NW Natural Proposed Summer 2017 Interim Pre-Remedial Design Data Gaps Field Sampling – Gasco Sediments Site

As discussed with the U.S. Environmental Protection Agency (EPA) during a meeting on August 3, 2017, NW Natural requests approval from the EPA to perform an interim round of pre-design data collection at the Gasco Sediments Site in early September 2017. NW Natural proposes that this interim data collection event occur during this timeframe to take advantage of annual low river water surface water elevations and to help inform the more comprehensive data gaps sampling event that will be proposed in the *Draft Pre-Remedial Design Data Gaps Work Plan and Sampling and Analysis Plan* we expect to submit to EPA in late 2017 or early 2018, in accordance with the EPA-approved Gasco Sediments Site revised Schedule of Project Deliverables (Anchor QEA 2017). NW Natural understands that the more comprehensive data gaps sampling event will include additional sampling locations and media to support a broader set of data objectives. This interim data collection event is not intended to modify the process for determination of data objectives and uses described in NW Natural's *Pre-Remedial Basis of Design Technical Evaluations Work Plan* (Work Plan; Anchor QEA 2017).

This interim data collection event will include the deployment of seepage meters to collect empirical data for offshore groundwater seepage at the Site in accordance with EPA's request in its letter dated April 4, 2017 (EPA 2017), and the data gaps sampling proposed in the Work Plan. Groundwater seepage data collection is ideal during the late summer and early fall (i.e., August through October) because the low river surface water elevations relative to high upland groundwater elevations result in the highest potential groundwater seepage fluxes. Empirical measurements of groundwater seepage were previously conducted at the Site by both the Lower Willamette Group (LWG) in August 2005 (Integral 2005) and by NW Natural in October 2007 (Anchor Environmental 2007). However, these collection efforts occurred prior to operation of the hydraulic control and containment (HC&C) system installed as part of the upland source controls for the Gasco property. During this proposed

event, NW Natural will measure groundwater seepage during similar low river surface water elevations and while the HC&C system is operating at full scale.

The remainder of this memorandum summarizes the scope of work for all proposed sampling activities and provides references to the previously EPA-approved quality assurance plans (QAPPs) and field sampling plans (FSPs).

Offshore Groundwater Seepage Meters

NW Natural proposes to deploy the identical type of seepage meter used by the LWG and NW Natural during the 2005 and 2007 groundwater seepage investigations, respectively, to obtain empirical data on zones of groundwater discharge and recharge at the Site. A detailed description of these meters and the type of data that will be obtained is provided in the *Portland Harbor RI/FS Round 2 Groundwater Pathway Assessment Sampling and Analysis Plan – Attachment 1 Field Sampling Plan Groundwater Plume Discharge Mapping* (Integral 2005). In summary, the meters are ultrasonic seepage meters available through Coastal Monitoring Associates (CMA) located in San Diego, California. Ultrasonic seepage meters are capable of time-series flow rate measurement, which captures both positive and negative seepage at the surface water-sediment interface. Conductivity, temperature, and pressure measurements may also be recorded from sensors mounted on the meter to support the seepage flux evaluations.

NW Natural proposes the deployment of six seepage meters in the offshore area of the Site that will be submerged during predicted summer river surface elevations. The target locations are shown in Figure 1, and the coordinates are listed in Table 1. The locations were determined based on the total number of available seepage meters (six) from CMA, co-location with three offshore locations previously sampled by LWG and NW Natural, areas that showed a large range of positive/negative fluxes prior to installation of the HC&C system, and spatial coverage of the offshore area of the Site that includes both capping and dredging remedial technologies identified in the Record of Decision. The seepage meters need to be deployed in at least 5 feet of river water to remain submerged during deployment, so each of the target locations are limited to the offshore portion of the Site, as shown in Figure 1. Groundwater seepage data from additional locations in the nearshore area of the Site should also be collected during the winter months with higher river surface elevations. Deployment of seepage meters at additional nearshore locations throughout the Site will be proposed in the more comprehensive *Pre-Remedial Design Data Gaps Work Plan and Sampling and Analysis Plan* for consideration by EPA.

Research Support Services (RSS) divers will deploy the seepage meters with oversight and equipment provided by CMA. CMA and RSS are available to deploy the seepage meters in early September 2017. RSS is a certified dive team, and the meters will be deployed under the EPA-approved *Dive Safety and Work Plan* (RSS 2017). NW Natural proposes deployment of each seepage meter for a

period of 2 to 3 days (the maximum battery duration for the meters), consistent with past Site deployments, to update groundwater seepage variations over multiple tidal cycles. The proposed seepage meter discharge flow measurement, decontamination, and field documentation procedures will be performed consistent with the *Portland Harbor RI/FS Round 2 Groundwater Pathway Assessment Sampling and Analysis Plan – Attachment 1 Field Sampling Plan Groundwater Plume Discharge Mapping* (Integral 2005).

References

Anchor Environmental (Anchor Environmental, L.L.C.), 2007. Letter to: Dana Bayuk, Oregon Department of Environmental Quality. Regarding: Proposed Groundwater Seepage Meter Deployment Scope of Work – Gasco Site. August 22, 2007.

Anchor QEA (Anchor QEA, LLC), 2010. *Final Project Area Identification Report and Data Gaps QAPP*. Prepared for the U.S. Environmental Protection Agency. Prepared on behalf of NW Natural. July 2010.

Anchor QEA, 2017. *Pre-Remedial Basis of Design Technical Evaluations Work Plan*. Prepared for the U.S. Environmental Protection Agency. Prepared on behalf of NW Natural. July 2017.

EPA (U.S. Environmental Protection Agency), 2017. Letter to: Bob Wyatt, NW Natural, and Myron Burr, Siltronic Corporation. Regarding: Gasco Groundwater Modelling Report, NW Natural Site. April 4, 2017.

Integral (Integral Consulting, Inc.), 2005. *Portland Harbor RI/FS Round 2 Groundwater Pathway Assessment Sampling and Analysis Plan – Attachment 1: Field Sampling Plan Groundwater Plume Discharge Mapping*. Prepared for the Lower Willamette Group. July 1, 2005.

RSS (Research Support Services), 2017. *Dive Safety and Work Plan: UltraSeep Deployment*. Prepared for Anchor QEA. August 2017.

Table

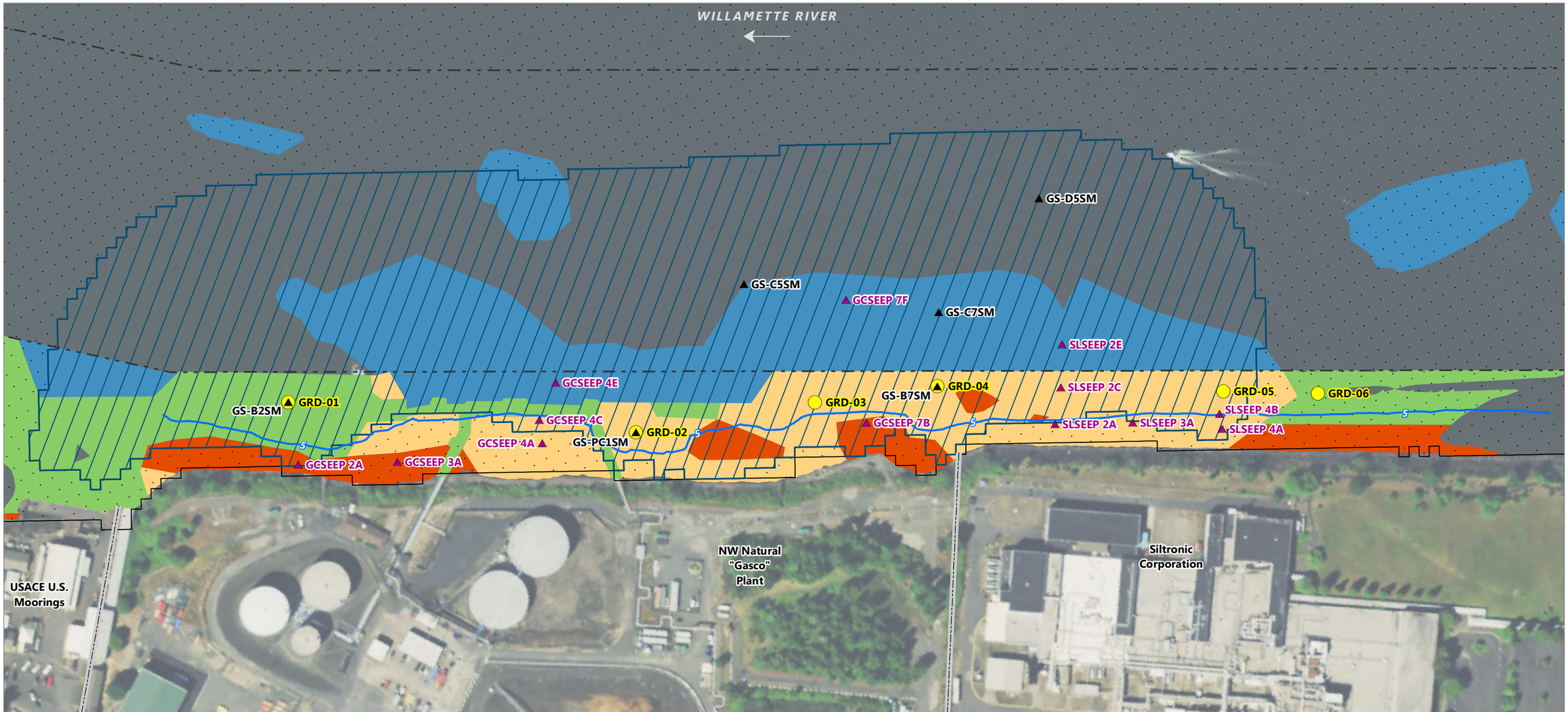
Table 1

Proposed Seepage Meter Locations

Station ID	Latitude (NAD83)	Longitude (NAD83)
GRD-01	45.58108110	-122.7604816
GRD-02	45.58000756	-122.7582451
GRD-03	45.57967074	-122.7569223
GRD-04	45.57942072	-122.7560316
GRD-05	45.57862673	-122.7541195
GRD-06	45.57836384	-122.7534873

Note:
NAD83: North American Datum of 1983

Figure



LEGEND:

- Navigation Channel
- Property Line

ROD Technology Assignment

- Cap
- Dredge
- Dredge in Nav-FMD
- Dredge with Cap

- Proposed Seepage Meter Location
- NW Natural Gasco Seepage Meter (2007)
- LWG Seepage Meter (2005)
- Average 5-foot Water Depth (July-October)

Simulated Groundwater Advective Flux Direction[1]

- Groundwater to River
- River to Groundwater

NOTES:

1. The groundwater advective flux shown was simulated using a steady-state MODFLOW groundwater flow model based on the average boundary conditions from February 2016. The model includes HC&C pumping, but does not simulate any fill remedy. The MODFLOW model was presented in the Gasco Groundwater Modeling Report dated February 17, 2017, and was reviewed and approved by Oregon Department of Environmental Quality (DEQ) for the upland Gasco property source control evaluation.
2. HC&C = Hydraulic control and containment.
3. Arrow indicates direction of flow of river.
4. Horizontal datum is NAD83 HARN Oregon State Plane North, Intl. Feet.
5. Vertical datum is City of Portland, feet.
6. Aerial imagery from 2014 NAIP.

0 200
Feet

Publish Date: 2017/08/23, 2:40 PM | User: eiverson
Filepath: \\orcas\GIS\Jobs\NW_Natural_Gas_0029\Gasco_Sediments\Maps\Sampling\AQ_ProposedOffshoreSampling.mxd

ANCHOR QEA

Figure 1
Proposed Seepage Meter Locations
Revised Summer 2017 Interim Pre-Design Data Gaps Sampling Proposal
Gasco Sediments Cleanup Action